Ground Penetrating Radar Analysis

Draft SOW (III)

The Pavement Analysis Section of the Montana Department of Transportation (MDT) started using ground penetrating radar (GPR) in 2006 in an effort to assist in the design of pavement sections for statewide reconstruction and rehabilitation projects.

It is for this reason the Montana Department of Transportation is initiating a research project to determine the feasibility of expanding the GPR program by maximizing the confidence level of the GPR data.

Note: This project will be a phased effort. The results of Phase 1 will determine whether MDT moves forward with Phase 2.

Scope of Work

Objective

The overall objective is to provide statistically defensible recommendations for the use of GPR statewide to aid in the determination of reconstruction and rehabilitation treatments. This objective is dependent on the ability of GPR to determine the variability of roadbed characteristics and to what extent GPR can delineate those characteristics in regards to determining the structural layer prevailing conditions. Note: This effort will only focus on roadbeds using bituminous asphalt. This project will include, but not be limited to:

Phase 1: Feasibility Study

Tasks

1. Through a review of current literature, industry practice, and interviews with State DOT's and Provinces; report on the current practice relating to the use of GPR in conjunction with pavement analysis programs. This task will put emphasis on the technical aspects of those programs that pertain to the objective of this effort. This is not a software development project; however, the contractor may report on existing software or emerging technology related to this effort.

2. It will be necessary for the contractor to understand how the Department currently conducts the GPR program. The contractor will report on all aspects of the non-destructive testing (NDT) activities and process relating directly to GPR use at MDT and how these activities relate to other NDT programs.

3. The variability of road bed structure by region, environmental, or seasonal factors that may influence the GPR analysis is a key element with this effort. There must be baseline documentation to reasonably ascertain that variability and to what extent GPR can be used for and conversely what GPR cannot delineate. The contractor must report on current GPR use and contemporary technology to delineate pavement layers. This must be substantiated prior to any proceeding with any proposed sampling efforts.

4. Tasks one (1) through three (3) should provide a clear rationale for phase 2.

Phase 2: Field Validation

Tasks

5. Current consensus within MDT indicates core samples may be required in the determination of which variables affect the quality of the GPR output. The sampling methodology must be warranted; and will be conducted and coordinated by the contractor with acceptance by MDT. GPR sampling will be conducted by MDT in coordination with the needs of the contractor. The contractor may submit other scenarios for validation.

6. The contractor is required to estimate the level of visitation to field and headquarter locations. The contractor is also responsible for the coordination of those events. If in-state data sampling phase is approved, all field work and data sampling activities must be in concurrence with and approved by MDT.

7. The contractor's recommendations as to which conditions, project types, etc lend themselves to GPR analysis.

8. The prospective contractor must also submit a technical support plan to assist MDT with future in-house calibration activities. This plan must be complete and sufficient enough to allow MDT to conduct all necessary calibration activities.